

Notice of Proposed Directive Amendments

Directive PNG003: Well Survey Requirements

Background

The Ministry of Energy and Resources (ER) is seeking comments from industry on proposed amendments to *Directive PNG003: Well Survey Requirements* (Directive PNG003). Proposed changes to Directive PNG003 include updated and clarified terminology and requirements for key information to be included in well survey plans, particularly for plans relating to horizontal, multi-lateral wells.

The Process

ER is holding consultations on the amended directive from June 7, 2024 and will last for three weeks. Following the close of formal public engagement ER will review any stakeholder responses in preparation for a final draft for publication in summer 2024.

Summary of Proposed Changes

Directive PNG003 came into effect in November 2015 and outlines requirements for survey plans for all wells licensed by ER. With the growing number and complexity of horizontal, multi-lateral wells in Saskatchewan, ER has identified opportunities to update Directive PNG003's terminology and key well survey plan components to promote clarity, consistency with other ER directives and more accurate data reporting in the Integrated Resource Information System (IRIS) for horizontal well survey plans. Notable clarification amendments proposed for Directive PNG003 include:

- Added definitions aligned to *Directive PNG006: Horizontal Oil and Gas Well Requirements* (Directive PNG006) to promote consistency in the labelling of data points on survey plans;
- References to Directive PNG006 to display lease boundary and inter-well set-back distances in relation to horizontal well paths; and,
- Linkages to *Directive PNG004: Surface Lease Construction Requirements* to display set-back radii in relation to prescribed set-back distances from surface lease boundaries.

Also, ER is proposing the following key changes to be made to Directive PNG003's information requirements relating to proposed well survey plans:

- Showing proposed wells and the unique identifier assigned by IRIS for all licensed wells;
- Using decimal degrees only for geographic coordinates for all points plotted on survey;
- Including a one-page overview displaying the subject well path in its entirety including all wellbore(s);
- For horizontal wells crossing Crown/Freehold and unit boundaries, a separate page showing the Ultimate Drainage Area and production allocation table as per Directive PNG006; and,
- Any inflection points and/or midsection bends in addition to corner angles.

As well, proposed changes to Directive PNG003's "as drilled" survey plan requirements for horizontal wells include displaying the Canadian Well Identification numbers for all wellbores and an indication of the wellbore drilling sequence, including start and end dates.

Review of Amended Directive

Appendix A contains a table (side-by-side) outlining the key amendments proposed for Directive PNG003. Appendix B contains a draft of the amended Directive PNG003. Please direct any comments or questions on the proposed amendments to:

ER Service Desk at er.servicedesk@gov.sk.ca
Attn: Carl Anderson

The deadline for submitting written comments is June 28, 2024.

APPENDIX A—Proposed Changes to Directive PNG003: Well Survey Requirements

| Existing Section/Wording | New Section and Wording | Explanation of Proposed Changes |
|---|---|--|
| <p>1. Introduction</p> <p>This Directive outlines the elements that are required in all survey plans for wells licensed by the Ministry of Energy and Resources (ER).</p> <p>A survey plan must be submitted by a licensee, as part a well licence application, an as-drilled survey is required after completion of drilling for all wells except those that are drilled vertically.</p> | <p>1. Introduction</p> <p>This Directive outlines the elements that are required in all survey plans for wells licensed by the Ministry of Energy and Resources (ER).</p> <p>A survey plan must be submitted by a licensee, as part of a well licence application. An as-drilled survey is also required to be submitted after completion of drilling operations for all wells except those that are drilled vertically that are not vertical wells.</p> | <p>Minor edits to promote clarity.</p> |
| <p>1.1 Governing Legislation</p> <p>This Directive should be used in conjunction with <i>The Oil and Gas Conservation Act (OGCA)</i> and <i>The Oil and Gas Conservation Regulations, 2012 (OGCR)</i>.</p> <p>It is the responsibility of all operators, as specified in the legislation, to be aware of ER requirements and to ensure compliance with all requirements prior to submitting a well survey.</p> | <p>1.1 Governing Legislation</p> <p>The requirements outlined in this Directive are authorized under and supported by:</p> <ul style="list-style-type: none"> • <i>The Oil and Gas Conservation Act (OGCA)</i> • <i>The Oil and Gas Conservation Regulations, 2012 (OGCR)</i> • Associated Directives and Guidelines: <ul style="list-style-type: none"> • <i>Directive PNG004: Surface Lease Construction Requirements (Directive PNG004)</i> • <i>Directive PNG006: Horizontal Oil and Gas Well Requirements (Directive PNG006)</i> • <i>Directive PNG013: Well Data Submission Requirements (Directive PNG013).</i> <p>It is the responsibility of all operators, as specified in the legislation, to be aware of ER’s requirements and to ensure compliance with all requirements prior to submitting a well survey.</p> | <p>First paragraph of section re-cast to match ER’s current directive drafting standards. Other ER directives mentioned in this directive are listed in this section and subsequently referred to in shortened form.</p> |
| <p>1.2 Definitions</p> <p>Bottom hole: means the termination point of a wellbore.</p> <p>Boundary coordinates: are measurements using a reference point of nearest boundaries of the Section.</p> | <p>1.2 Definitions</p> <p>Bottom hole: means the termination point of a wellbore.</p> <p>Boundary coordinates: are measurements using a reference point of nearest boundaries of the Section.</p> | <p>Updates to definitions are meant to establish consistent language on labeling of points on well survey plans.</p> <p>No change.</p> <p>No change.</p> |

| Existing Section/Wording | New Section and Wording | Explanation of Proposed Changes |
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| <p>Directionally-drilled well: is a well that is not vertical but does not meet the minimum criteria to be horizontal.</p> | <p>Directionally-drilled well: is a well that is not vertical but does not meet the minimum criteria to be horizontal.</p> | <p>No change.</p> |
| <p>Dwelling: means a building occupied by a person on a temporary or permanent basis.</p> | <p>Dwelling: means a building occupied by a person on a temporary or permanent basis.</p> | <p>No change.</p> |
| <p>Horizontally-drilled well: is a well drilled with a productive length that is at least 80 degrees from vertical for 100 m.</p> | <p>Horizontal well: means a well that has a productive interval of at least 100 metres (m) and that is at least 80 degrees from the vertical or is deemed by the minister to be horizontal.</p> | <p>Updated to clarify what is meant by horizontal well for the purposes of this directive.</p> |
| <p>N/A – NEW</p> | <p>Inter-well set-back: as defined in Directive PNG006.</p> | <p>Added to support requirements for set-back radii in section 2.2, new bullet #3.</p> |
| <p>Intermediate casing point: means point where the intermediate casing lands.</p> | <p>Intermediate casing point (ICP): means the point where the intermediate casing lands.</p> | <p>No change.</p> |
| <p>Kickoff point: means where an additional wellbore begins on a multi-bore horizontal well.</p> | <p>Kickoff point: means where an additional wellbore begins on a multi-bore horizontal well.</p> | <p>No change.</p> |
| <p>Landing point: refers to the point where the well path has reached horizontal or near horizontal position within the target pool and is only applicable to a monobore horizontal well.</p> | <p>Landing point (LP): Refers to the point where the well path has reached at least 80 degrees from the vertical position within the target pool and is only applicable to a monobore horizontal well.</p> | <p>Updated to align with amended horizontal well definition above.</p> |
| <p>N/A – NEW</p> | <p>Lease boundary set-back: as defined in Directive PNG006.</p> | <p>Added to support requirements for set-back radii in section 2.2, new bullet #3.</p> |
| <p>Monobore: means a horizontal well with a single string of production casing, with uniform diameter, cemented from total depth to surface.</p> | <p>Monobore: means a horizontal well with a single string of production casing, with uniform diameter, cemented from total depth to surface.</p> | <p>No change.</p> |
| <p>N/A – NEW</p> | <p>Productive Interval: as defined in Directive PNG006.</p> | <p>Definition added to align with Directive PNG006.</p> |
| <p>Rectangular co-ordinates: are measurements using a reference point of the well origin.</p> | <p>Rectangular co-ordinates: are measurements using a reference point of the well origin.</p> | <p>No change.</p> |
| <p>Target area: means the specified area within a drainage unit allocated to one well completion for the purpose of producing oil or gas from a non-horizontal oil well or a gas well.</p> | <p>Target area: means the specified area within a drainage unit allocated to one well completion for the purpose of producing oil or gas from a non-horizontal oil well or a gas well.</p> | <p>No change.</p> |
| <p>N/A – NEW</p> | <p>Vertical well: means a well drilled from surface to bottom hole without intentional deviation from vertical.</p> | <p>Added to support edits to Section 1, paragraph #2.</p> |

| Existing Section/Wording | New Section and Wording | Explanation of Proposed Changes |
|--|---|--|
| <p>Water body: means a body of water or an area where water flows or is present, whether the flow or the presence of water is continuous, seasonal or intermittent, or occurs only during a flood.</p> <p>Wellbore: means a path of drilled footage from the well origin (or kick off) to terminating point.</p> | <p>Water body: means a body of water or an area where water flows or is present, whether the flow or the presence of water is continuous, seasonal or intermittent, or occurs only during a flood.</p> <p>Wellbore: means a path of drilled meterage from the well origin to a terminating point or, for wellbores drilled from existing wellbores, the kickoff point to a terminating point.</p> | <p>No change.</p> <p>Definition updated to be more inclusive of subsequent wellbores in a multi-bore situation.</p> |
| <p>2.1 Basic Survey Plan Components</p> <p>A survey plan must consist of the following components:</p> <ul style="list-style-type: none"> • Be in a scale acceptable to the minister; • Have a unique identifier for each well shown on the survey as assigned by IRIS (CWI, UWI or Well Licence are acceptable); • Be prepared from a survey made by a Saskatchewan Land Surveyor, within the meaning of <i>The Land Surveyors and Professional Surveyors Act</i>; • Be dated, certified, and signed by the surveyor, with the signature duly witnessed; • Have a survey date that is less than 12 months prior to the date of submission; • Show the location of the proposed well origin in relation to any of the following items situated within 200 metres of the proposed well site: <ul style="list-style-type: none"> • The boundaries of the section. • Water bodies; • Mines, whether worked or abandoned; • Existing wells and abandoned wells; • Roadways, road allowances, railways, pipelines, power lines, and any other right of way; • Aircraft runways or taxiways; and • Structures of every kind; • Show the elevation of the well site and the locations of: <ul style="list-style-type: none"> • The surface lease boundaries; • The access road; and • The target area (if applicable); • Have all measurements and distances tied to: <ul style="list-style-type: none"> • A surveyed monument or evidence of a surveyed monument in a surveyed area; or | <p>2.1 Basic Survey Plan Components</p> <p>A survey plan must consist of the following components:</p> <ul style="list-style-type: none"> • Be prepared from a survey made by a Saskatchewan Land Surveyor, within the meaning of <i>The Land Surveyors and Professional Surveyors Act</i>; • Be dated, certified, and signed by the surveyor, with the signature duly witnessed; • Have a survey date that is less than 12 months prior to the date of submission; • Be in a scale acceptable to the minister; • Display all applicable set-back radii from well origin at corresponding distances as required by Directive PNG004; • Show the location of the proposed well origin in relation to any of the following items if they are situated within 200 metres of the proposed well-site surface lease; <ul style="list-style-type: none"> • The boundaries of the section; • Water bodies; • Mines, whether worked or abandoned; • Existing wells and abandoned wells; • Roadways, road allowances, railways, pipelines, power lines, and any other right of way; • Aircraft runways or taxiways; and • Structures of every kind; • Show all proposed wells; • Show all licensed wells labeled with CWI, UWI or well licence; <ul style="list-style-type: none"> • If well is abandoned, label as abandoned. • Show the elevation of the well site and the locations of: <ul style="list-style-type: none"> • The well origin; • The surface lease boundaries; • The access road; and | <p>Beginning of section has been re-organized to reflect a more logical ordering of basic survey plan components.</p> <p>New bullet #5 outlines requirement to display set-back radii (i.e. buffer zones) to align with the requirements of Directive PNG004. Updated terminology from “well site” to “surface lease”.</p> <p>Added requirement to show proposed wells and clarification (in relation to bullet #2 in the current Directive PNG003) that only licensed wells displayed on a survey plan need to include the CWI, UWI or licence as assigned by IRIS.</p> |

| Existing Section/Wording | New Section and Wording | Explanation of Proposed Changes |
|---|---|--|
| <ul style="list-style-type: none"> • A surveyed base line, or • Some prominent topographical feature acceptable to the minister in an unsurveyed area; • State in the legend the true East/West and North/South co-ordinates of the well site relative to the initial reference point used in the survey (section corner monument, surveyed base line, etc.); • Existing wells and abandoned wells within the drainage unit(s) from which the proposed well is intended to produce; • State in the legend the latitude and longitude of the well site, in North American Datum 1983 (NAD83). <p>For directionally-drilled, slant-drilled or horizontally-drilled wells:</p> <ul style="list-style-type: none"> • The proposed intermediate casing point (ICP) or landing point (LP) for horizontal wells only and the proposed bottom-hole location; • In relation to the boundaries of the section; and • In relation to the well origin by rectangular co-ordinates; <p>Horizontal wells do not need to show a target area on the survey.</p> | <ul style="list-style-type: none"> • The target area (if applicable); • Have all measurements and distances tied to: <ul style="list-style-type: none"> • A surveyed monument or evidence of a surveyed monument in a surveyed area; or • A surveyed base line, or • Some prominent topographical feature acceptable to the minister in an unsurveyed area; • State in the legend the true East/West and North/South co-ordinates of the well site relative to the initial reference point used in the survey (section corner monument, surveyed base line, etc.); • Existing wells and abandoned wells within the drainage unit(s) from which the proposed well is intended to produce; • State in the legend the decimal degrees latitude and longitude of all points plotted on the survey, in North American Datum 1983 (NAD83). <p>Survey plans for all wells must be drawn in relation to the boundaries of the section and in relation to the well origin by rectangular co-ordinates.</p> <p>For directionally-drilled, slant-drilled or horizontally-drilled wells:</p> <ul style="list-style-type: none"> • The proposed intermediate casing point (ICP) or landing point (LP) for horizontal wells only and the proposed bottom-hole location; • In relation to the boundaries of the section; and • In relation to the well origin by rectangular co-ordinates; <p>Horizontal wells do not need to show a target area on the survey.</p> | <p>Bullet deleted as it is already covered by new bullets above relating to displaying proposed/licensed wells.</p> <p>For consistency, clarification has been added that points plotted on a well survey must be referenced using decimal degrees.</p> <p>Clarification added that <u>all</u> wells (not just directionally-drilled, slant drilled or horizontally-drilled wells) must be drawn in relation to the section and in relation to the well origin by rectangular coordinates. Also, requirements to show ICP/LP for horizontal wells are already reflected in section 2.2 (see bullets relating to boundary and rectangular coordinates).</p> <p>Sentence is not to be carried forward as it is redundant. Definition of “target area” above already specifies that target area applies to non-horizontal oil or gas wells.</p> |
| <p>2.2 Additional Survey Plan Requirements</p> <p>In addition to the above basic components, a survey plan must also include the following:</p> <ul style="list-style-type: none"> • Complete drawings of all quarter sections where the surface well origin and entire directionally-drilled (DD) or horizontal (HZ) wellbores are located. | <p>2.2 Additional Survey Plan Requirements</p> <p>In addition to the above basic components, a survey plan must also include the following:</p> <ul style="list-style-type: none"> • One page overview displaying the subject well path in its entirety including all wellbore(s). | <p>Added requirement to provide a zoom-out overview of the well-path in its entirety, including all well bores.</p> |

| Existing Section/Wording | New Section and Wording | Explanation of Proposed Changes |
|---|---|---|
| <ul style="list-style-type: none"> All applicable linear measurements, any midsection bends, corner angles and the bearing of at least one adjacent boundary for the quarter sections referred to in the component above. Cartesian co-ordinates, referenced from the nearest section corner to the well origin location. These co-ordinates may not necessarily be tied to a survey monument. Boundary co-ordinates, referenced from the nearest boundaries of the section to the: <ul style="list-style-type: none"> Well origin location; Bottom-hole location of all wellbores associated with all wells; ICP/LP of HZ wells; Kickoff point of all subsequent wellbores of HZ wells; Target completion point of DD wells. <p><i>Note:</i></p> <ul style="list-style-type: none"> Wells located within partial sections are always referenced from the east side of the section. For wells where the surface well origin and bottom hole are not contained within the same quarter section, the surface and bottom hole co-ordinates must be referenced to their respective quarter section boundaries. Wells with an origin or bottom hole located within a road allowance must reference the boundaries of the adjacent LSD for land description. Wells on a road allowance running north-south must reference the LSD immediately to the east. Wells in an east-west road allowance must reference the LSD immediately to the north. Wells located on an LSD boundary must reference the lower LSD as the bottom hole or origin location. Rectangular coordinates, referenced from the well origin to the: <ul style="list-style-type: none"> Bottom hole for all DD and HZ wells and for every bore of a HZ well; ICP/LP of all HZ wells; Kickoff point of all subsequent bores; Target completion point of all DD wells. | <ul style="list-style-type: none"> Complete drawings of all quarter sections where the surface well origin and entire directionally-drilled (DD) or horizontal (HZ) wellbores are located; For horizontal wells, display from the subject well the lease boundary set-back and the inter-well set-back as required by Directive PNG006; For horizontal wells crossing boundaries from Provincial Crown to Non-Provincial Crown or unit boundaries, the survey must include a separate page showing the Ultimate Drainage Area and production allocation table as per Directive PNG006; All applicable linear measurements, any inflection points and/or midsection bends, corner angles and the bearing of at least one adjacent boundary for the quarter sections referred to in the component above; Cartesian co-ordinates, referenced from the nearest section corner to the well origin location. These co-ordinates may not necessarily be tied to a survey monument; Boundary co-ordinates, referenced from the nearest boundaries of the section to the: <ul style="list-style-type: none"> Well origin location; Bottom-hole location of all wellbores associated with all wells; ICP/LP of horizontal (HZ) wells; Kickoff point of all subsequent wellbores of horizontal wells; Target completion point interval of directionally-drilled (DD) wells. <p><i>Note:</i></p> <ul style="list-style-type: none"> Wells located within partial sections are always referenced from the east side of the section. For wells where the surface well origin and bottom hole are not contained within the same quarter section, the surface and bottom hole co-ordinates must be referenced to their respective quarter section boundaries. Wells with an origin or bottom hole located within a road allowance must reference the boundaries of the adjacent legal subdivision (LSD) for land description. Wells on a road | <p>Added requirement to show lease boundary and inter-well set-backs (i.e. “buffer zones”) to align with Directive PNG006.</p> <p>Added requirement to include with proposed survey plan in table format on a separate page the results of calculations relating to Ultimate Drainage Area where required by Directive PNG006. This will support ER reviews of production allocation on Crown-Freehold and unit-crossing wells as this information must be part of a licence application. Including this information with a survey plan is also expected to help industry when submitting applications and ER’s review to ensure the correct information is being entered in IRIS.</p> <p>Reference to “target completion point” changed to “target completion interval”.</p> |

| Existing Section/Wording | New Section and Wording | Explanation of Proposed Changes |
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| <ul style="list-style-type: none"> If applicable, a reference to the convergence angle in the legend. This is necessary in order to obtain local geodetic bearings referenced to the meridian through well origin. Residence sketch, showing all public facilities and dwellings within 1.5 km of the well origin. | <p>allowance running north-south must reference the LSD immediately to the east. Wells in an east-west road allowance must reference the LSD immediately to the north.</p> <ul style="list-style-type: none"> Wells located on an LSD boundary must reference the lower LSD as the bottom hole or origin location. Rectangular coordinates, referenced from the well origin to the: <ul style="list-style-type: none"> Bottom hole for all directionally-drilled (DD) and horizontal (HZ) wells and for every bore of a horizontal (HZ) well; ICP/LP of all horizontal (HZ) wells; Kickoff point of all subsequent bores; Target completion point of all directionally-drilled wells. If applicable, a reference to the convergence angle in the legend. This is necessary in order to obtain local geodetic bearings referenced to the meridian through well origin. Residence sketch, showing all public facilities and dwellings within 1.5 km of the well origin and all other applicable set-back radii in relation to dwellings as required by Directive PNG004. | <p>Added requirement to final bullet to show set-back radii (i.e. buffer zones) in relation to dwellings to align with Directive PNG004.</p> |
| <p>3. “As Drilled” Survey Plan Requirements</p> <p>Once a well is drilled, an “as drilled” survey plan for all DD and HZ wells must be completed. These “as drilled” surveys must include:</p> <ul style="list-style-type: none"> All the requirements listed above for proposed survey plans; The completed interval for DD wells First and last perforation points for a monobore HZ well; and The well CWI | <p>3. “As Drilled” Survey Plan Requirements</p> <p>Once a well is drilled, an “as drilled” survey plan for all wells must be completed prepared. These “as drilled” surveys must include:</p> <ul style="list-style-type: none"> All the requirements listed above for proposed survey plans; The completed interval for directionally-drilled (DD) wells First and last perforation points for a monobore horizontal (HZ) well; and The well CWI and wellbore(s) CWI; and An indication of the wellbore drilling sequence including the start and end date in tabular format. | <p>Bullet #4 has been expanded to require the inclusion of CWIs of all wellbores in addition to the main wellbore.</p> <p>Bullet #5 has been added to require the wellbore drilling sequence, including the start and end dates to be added to the as-drilled survey. This is to help eliminate confusion in IRIS reporting between ER and industry and will allow ER to verify if the data have been reported correctly.</p> |

APPENDIX B



Well Survey Requirements

Directive PNG003

June 2024

Revision 2.0

Governing Legislation:

Act: *The Oil and Gas Conservation Act*

Regulation: *The Oil and Gas Conservation Regulations, 2012*

Order:

Record of Change

| Revision | Date | Description |
|-----------------|----------------|--|
| 0.0 | | Initial draft |
| 1.0 | November, 2015 | Live version, updated wording, added directive number. |
| 2.0 | June 2024 | Revised definitions, clarification of terminology referenced in well survey plans to reflect industry standards. |

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1. Introduction

This Directive outlines the elements that are required in all survey plans for wells licensed by the Ministry of Energy and Resources (ER).

A survey plan must be submitted by a licensee as part of a well licence application. An as-drilled survey is also required to be submitted after completion of drilling operations for all wells that are not vertical wells.

1.1 Governing Legislation

This Directive should be used in conjunction with *The Oil and Gas Conservation Act (OGCA)* and *The Oil and Gas Conservation Regulations, 2012 (OGCR)*.

The requirements outlined in this Directive are authorized under and supported by:

- *The Oil and Gas Conservation Act (OGCA)*
- *The Oil and Gas Conservation Regulations, 2012 (OGCR)*
- Associated Directives and Guidelines:
 - *Directive PNG004: Surface lease Construction Requirements (Directive PNG004)*
 - *Directive PNG006: Horizontal Oil and Gas Well Requirements (Directive PNG006)*
 - *Directive PNG013: Well Data Submission Requirements (Directive PNG013)*.

It is the responsibility of all operators, as specified in the legislation, to be aware of ER requirements and to ensure compliance with all requirements prior to submitting a well survey

1.2 Definitions

Bottom hole (depth): Means the distance, in metres from the surface to a wellbore's endpoint.

Boundary co-ordinates: are measurements using a reference point of nearest boundaries of the Section.

Directionally-drilled well: Is a well that is not vertical but does not meet the minimum criteria to be horizontal.

Dwelling: Means a building occupied by a person on a temporary or permanent basis.

Horizontal well: Means a well that has a productive interval of at least 100 metres (m) or that is at least 80 degrees from the vertical or is deemed by the minister to be horizontal.

Inter-well set-back: As defined in Directive PNG006.

Intermediate Casing Point (ICP): means the point where the intermediate casing lands.

Landing point (LP): Refers to the point where the well path has reached at least 80-degrees from the vertical position within the target pool and is only applicable to a monobore horizontal well.

Lease boundary set-back: as defined as Directive PNG006.

Monobore: means a horizontal well with a single string of production casing, with uniform diameter, cemented from total depth to surface.

Productive interval: as defined in Directive PNG006.

Rectangular co-ordinates: are measurements using a reference point of the well origin.

Target area: means the specified area within a drainage unit allocated to one well completion for the purpose of producing oil or gas from a non-horizontal oil well or a gas well.

Vertical Well: means a well drilled from surface to bottom hole without intentional deviation from vertical.

Water body: means a body of water or an area where water flows or is present, whether the flow or the presence of water is continuous, seasonal or intermittent, or occurs only during a flood.

Wellbore: means a path of drilled meterage from the well origin to a terminating point or, for wellbores drilled from existing wellbores, the kickoff point to a terminating point.

2. Mandatory Components of a Survey Plan

For a survey plan to be accepted by ER, it must contain all the components listed in subsections 2.1 and 2.2 and must comply with all the requirements set out for them.

2.1 Basic Survey Plan Components

A survey plan must consist of the following components:

- Be prepared from a survey made by a Saskatchewan Land Surveyor, within the meaning of *The Land Surveyors and Professional Surveyors Act*;
- Be dated, certified, and signed by the surveyor, with the signature duly witnessed;
- Have a survey revision date (new or revised) that is less than 12 months prior to the date of submission;
- Be in a scale acceptable to the minister;
- Display all applicable set back radii from well origin at corresponding distances as required by Directive PNG004;
- Show the location of the well origin in relation to of the following items situated within 200 metres of the surface lease;
 - The boundaries of the Section;
 - Water bodies;
 - Mines, whether worked or abandoned;
 - Existing wells and abandoned wells;
 - Roadways, road allowances, railways, pipelines, power lines, and any other right of way;
 - Aircraft runways or taxiways; and,

- Structures of every kind;
- Show all proposed wells;
- Show all licensed wells labeled with CWI, UWI or well licence;
 - If well is abandoned, label as abandoned.
- Show the elevation of the well site and the locations of:
 - The well origin;
 - The surface lease boundaries;
 - The access road; and,
 - The target area (if applicable);
- Have all measurements and distances tied to:
 - A surveyed monument or evidence of a surveyed monument in a surveyed area; or
 - A surveyed base line, or
 - Some prominent topographical feature acceptable to the minister in an unsurveyed area;
- State in the legend the true East/West and North/South co-ordinates of the well site relative to the initial reference point used in the survey (section corner monument, surveyed base line, etc.);
- State in the legend the decimal degrees latitude and longitude of all points plotted on the survey, in North American Datum 1983 (NAD83).

Survey plans for horizontal wells must be drawn in relation to the boundaries of the section and in relation to the well origin by rectangular co-ordinates.

2.2 Additional Survey Plan Requirements

In addition to the above basic components, a survey plan must also include the following:

- One page overview displaying the well path in its entirety of all wellbore(s).
- Complete drawings of all quarter sections where the surface well origin and entire directionally-drilled or horizontal wellbores are located;
- For horizontal wells, display from the subject well the lease boundary set-back and the inter-well set-back as required by Directive PNG006;
- For horizontal wells crossing boundaries from the Provincial Crown to Non-Provincial Crown or unit boundaries, the survey must include a separate page showing the Ultimate Drainage Area and production allocation table as per Directive PNG006;
- All applicable linear measurements, any inflection point(s) and/or midsection bends, corner angles and the bearing of at least one adjacent boundary for the quarter sections referred to in the component above;
- Cartesian co-ordinates, referenced from the nearest section corner to the well origin location. These co-ordinates may not necessarily be tied to a survey monument;
- Boundary co-ordinates, referenced from the nearest boundaries of the section to the:
 - Well origin location;
 - Bottom-hole location of all wellbores associated with all wells;
 - ICP/LP of horizontal wells;
 - Kickoff point of all subsequent wellbores of horizontal wells;
 - Target completion point of directional-drilled wells.

Note:

- Wells located within partial sections are always referenced from the east side of the section.
- For wells where the surface well origin and bottom hole are not contained within the same quarter section, the surface and bottom hole co-ordinates must be referenced to their respective quarter section boundaries.
- Wells with an origin or bottom hole located within a road allowance must reference the boundaries of the adjacent legal subdivision (LSD) for land description. Wells on a road allowance running north-south must reference the LSD immediately to the east. Wells in an east-west road allowance must reference the LSD immediately to the north.
- Wells located on an LSD boundary must reference the lower LSD as the bottom hole or origin location.
 - Rectangular coordinates, referenced from the well origin to the:
 - Bottom hole for all directional drilling and horizontally wells and for every bore of a horizontal well;
 - ICP/LP of all horizontal wells;
 - Kickoff point of all subsequent bores; and,
 - Target completion interval of all directionally-drilled wells.
- If applicable, a reference to the convergence angle in the legend. This is necessary in order to obtain local geodetic bearings referenced to the meridian through well origin.
- Residence sketch, showing all public facilities and dwellings within 1.5 km of the well origin and all other applicable set back radii in relation to dwellings as required by Directive PNG004.

3. “As Drilled” Survey Plan Requirements

Once a well is drilled, an “as drilled” survey plan for all directional drilled and horizontal wells must be prepared. These “as drilled” surveys must include:

- All the requirements listed above for survey plans;
- The completed interval for directionally-drilled wells
- First and last perforation points for a monobore horizontal well;
- The well CWI and wellbore(s) CWI; and,
- An indication of the wellbore drilling sequence including the start and end date in tabular format.